UNITED STATES PATENT AND TRADEMARK OFFICE

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10/680,261	10/08/2003	Toru Matama	Q77927	5655

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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 January 2008*.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-51* is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☒ Claim(s) *35-47* is/are allowed.
6)☒ Claim(s) *21,25,27,28,30-34,49,50 and 2224* is/are rejected.
7)☒ Claim(s) *23,26,29,48 and 51* is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All   b)☐ Some * c)☐ None of:
        1.☐ Certified copies of the priority documents have been received.
        2.☐ Certified copies of the priority documents have been received in Application No. _____.
        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments, filed 1/22/2008, with respect to the rejection of claims 21,

22, 24, 25 under 35 U.S.C 102 have been fully considered and are persuasive.

Therefore, the rejection has been withdrawn. However, upon further consideration, a

new ground of rejection is made in view of Mann and Boyack et al. (US 5,724,456).

2.   Applicant's arguments filed, filed 1/22/2008, with respect to claims 27, 30-34

have been fully considered but they are not persuasive.

        The Applicant asserts that there is no selection made among images S1, S2, S3

(212_1, 212_2 and 212_3, respectively) (remarks, page 17).

        In response, the Examiner understands the Applicant's arguments but

respectfully disagrees.

        As disclosed in col. 11, lines 51-54 of Mann, the main system memory 210 is

capable of storing a sequence of images 212_1, 212_2, 212_3...It is clearly seen from the

disclosure of Mann that the total number of images in the sequence exceeds the above

three images. Since only three images 212_1, 212_2 and 212_3 are used for synthesis,

these three images are *inherently* selected as first optimal images out of the sequence

of images. In another interpretation, the three images 212_1, 212_2 and 212_3 must be

selected in one way or another for the image synthesis to function as disclosed. Thus,

the limitations of "selection means for selecting a plurality of optimal first images for

synthesis among said image data of said plurality of second images obtained by said

acquiring means" is met by Mann.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3.   Claims 27, 30 & 31 are rejected under 35 U.S.C. 102(a) as being anticipated by

Mann (US 5,828,793).

Regarding claim 27, Mann discloses an image processing apparatus (Fig. 8),

comprising:

acquiring means (image source 202 and system bus 206 shown in Fig. 8) for

acquiring image data of a plurality of second images obtained by taking a single scene

under different exposure conditions (Fig. 7B; col. 3, lines 33-36; col. 10, lines 58-67 and

col. 11, lines 40-54, wherein "a plurality of second images" are represented by a

sequence of video frames or series of images stored in the mass storage device 208);

selection means (CPU 220 in combination with user interface 250 and keyboard

230) for selecting a plurality of optimal first images (Fig. 7B, wherein "optimal first

images" are represented by images 212_1, 212_2 and 212_3 or S1, S2 and S3) for synthesis

among said image data of said plurality of second images obtained by said acquiring

means (col. 11, lines 51-54 and col. 12, line 61 – col. 12, line 59, and note that the images of differently exposed images are inherently selected).

synthesis means (210, combiner 246) for synthesizing image data of said plurality of the optimal first images selected by said selection means to generate synthesized image data of a composite image, wherein said synthesis means sets synthesis conditions (i.e., weighting conditions, certainty functions) of image synthesis using said image data of said plurality of first images, and synthesizes said image data of said plurality of first images using said set synthesis conditions (col. 11, lines 5-21 and col. 12, lines 36-59).

Regarding claim 30, also disclosed by Mann is weighting to each image to be synthesized at the time of the image synthesis is determined in accordance with the image data of said plurality of first images (see col. 11, lines 13-21).

Regarding claim 31, Mann further discloses that said plurality of first mages are taken by a digital camera (col. 11, lines 43-46), and said synthesized image data output from said synthesis means (to display screen 234 shown in Fig. 8; col. 12, lines 44-49).

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 32-34 & 49 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Mann (US 5,828,793) in view of Shiraiwa et al. (US 6,160,579).

Regarding claims 32 & 33, Mann does not explicitly disclose that said selection

means selects said plurality of optical first images for synthesis using shooting time of

day and said image data of said plurality of second images.

However, as taught by Shiraiwa, images of a same scene are selected for

synthesis by finding correlation between the images based on the shooting times which

are close together within a predetermined time period as a group of images out of a

plurality of images stored in a camera memory so as to effectively process the group of

images for synthesis to prevent the boundaries of luminances of images from becoming

unnatural (see Shiraiwa, col. 7, line 65 – col. 8, line 13 and abstract).

Therefore, it would have been obvious to one of ordinary skill in the art to modify

the image processing apparatus in Mann to include the teaching of Shiraiwa to select

the plurality of optimal first images for synthesis using shooting time of day and said

image data of said plurality of second images so as to effectively process the group of

images for synthesis to prevent the boundaries of luminances of images from becoming

unnatural.

Regarding claim 34, Mann in view of Shiraiwa further discloses said selection

means judges a plurality of third images (a pair of images obtained in Mann) obtained

by taking a single scene under different exposure conditions using said shooting time of

day of said plurality of second images (note that the analyses of claims 32 & 33 are

applied in this claim), prepares respective histograms of said plurality of third images

using image data of said plurality of third images, and selects said plurality of optimal

first images for synthesis using the prepared respective histograms (see Mann, col. 8,

lines 16-64, wherein a cross histogram is created for each pair of images for a plurality

of images to select optimal images for synthesis).

Regarding claim 49, the combined teaching of Mann and Shiraiwa also discloses

that said selection means automatically selects (by date/time, see Shiraiwa, col. 7, line

65 – col. 8, line 13) said plurality of optimal first images for synthesis among said image

data of said plurality of second images such that said synthesized image data of the

composite image has a dynamic range as wide as possible (see Mann, Fig. 7B and col.

1, lines 6-9).

6.   Claims 21, 22, 24, 25, 28 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Mann (US 5,828,793) in view of Boyack et al. (US 5,724,456).

Regarding claim 21, Mann discloses an image processing apparatus (Fig. 8),

comprising:

acquiring means (image source 202 and system bus 206 shown in Fig. 8) for

acquiring image data of a plurality of first images (images S1 – S3 shown in Fig. 7B) to

be synthesized that are obtained by taking a single scene under different exposure
conditions (underexposed, properly exposed and overexposed images; see col. 3, lines
33-36; col. 10, lines 58-67 and col. 11, lines 40-54);

synthesis means (210, combiner 246) for synthesizing said image data of said
plurality of first images obtained by said acquiring means to generate synthesized
image data of a composite image (see Figs. 7A, 7B & 8; col. 3, lines 34-65 and col. 11,
lines 13-21 and col. 12, lines 32-59);

image processing means (210, filters 255, gamma correction for altering contrast
of image) for subjecting the synthesized image data of said composite image by said
synthesis means to image processing (i.e., gamma correction for altering contrast of
image; see col. 10, lines 32-35 and col. 13, lines 4-8), wherein said synthesis means
sets synthesis conditions (i.e., weighting conditions, certainty functions) of image
synthesis using said image data of said plurality of first images, and synthesizes said
image data of said plurality of first images using said set synthesis conditions (see Fig.
7A; col. 11, lines 5-21 and col. 12, lines 36-59).

Mann is just silent as to the image processing include dodging processing.

However, as taught by Boyack, it is well known in the art to implement dodging
processing in addition to the gamma/contrast correction so as to improve local
brightness adjustment since they seem to be synergistic when used together (see
Boyack, col. 13, lines 15-27).

Therefore, it would have been obvious to one of ordinary skill in the art to modify
the apparatus in Mann to incorporate the teaching of Boyack to include dodging

processing in addition to the gamma/contrast correction so as to improve local brightness adjustment since they seem to be synergistic when used together.

Regarding claim 22, Mann also discloses that the synthesis means performs said image synthesis after converting said image data of said plurality of first images to subject luminance data of logarithm scales (see Figs. 1, 3 & 4; col. 4, lines 48-60; col. 5, lines 5-24; col. 6, lines 65-67 and col. 9, line 15).

Regarding claim 24, also disclosed by Mann is weighting to each image to be synthesized at the time of the image synthesis is determined in accordance with the image data of said plurality of first images (see col. 11, lines 13-21).

Regarding claim 25, Mann further discloses that said plurality of first mages are taken by a digital camera (col. 11, lines 43-46), and said synthesized image data output from said synthesis means (to display screen 234 shown in Fig. 8; col. 12, lines 44-49).

Regarding claim 28, this claim is also met by the analysis of claim 21.

7.   Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mann (US 5,828,793) and Shiraiwa et al. (US 6,160,579) and in further view of Boyack et al. (US 5,724,456).

Regarding claim 50, as discussed in claim 49, the selection means automatically selects said plurality of optimal first images for synthesis among said image data of said plurality of second images such that said synthesized image data of the composite image is capable of reproducing overall image scene having the dynamic range as wide as possible.

Mann and Shiraiwa are silent about reproducing the overall image scene from highlight to shadow without washed-out highlight or dull shadow.

However, such lack of teaching is compensated by Boyack. According to Boyack, it is well known in the art to implement dodging processing in addition to the gamma/contrast correction so as to improve local brightness adjustment since they seem to be synergistic when used together so that overexposed (washed-out highlight) to underexposed (dull shadow) areas are properly compensated (see Boyack, col. 13, lines 15-27).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the apparatus in Mann to incorporate the teaching of Boyack to include dodging processing in addition to the gamma/contrast correction so as to improve local brightness adjustment since they seem to be synergistic when used together so that overexposed (washed-out highlight) to underexposed (dull shadow) area would be properly compensated.

Allowable Subject Matter

1.   **Claims 23, 26, 29, 48 and 51** are objected to as being dependent upon a

rejected base claim, but would be allowable if rewritten in independent form including all

of the limitations of the base claim and any intervening claims.

Claims 35-47 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding independent claims 35, 39 & 47, the prior art of record fails to teach or

fairly suggest the combination of all limitations of each of claims 35, 39 & 47 that

includes *"...determines logarithmic values of the shutter speeds and the aperture sizes*

of the stop when said one image and said respective images were taken respectively,

calculates each first difference between each of the determined logarithmic values of

the shutter speeds when said respective images were taken and each of the determined

logarithmic values of the shutter speeds when said one image was taken, and each

second difference between each of the determined logarithmic values of the aperture

sizes of the stop when said respective images were taken and each of the determined

logarithmic values of the aperture sizes of the stop when said one image was taken,

and adds said each first difference and said each second difference for said respective

images to calculate the shifting amounts of the respective images."

The following is a statement of reasons for the indication of allowable subject

matter:

Regarding claim 23, the prior art of record also fails to teach or fairly suggest the

limitations of claim 23 that includes *"said synthesis conditions are shifting amounts of*

the subject luminance data of respective images from the subject luminance data of one

image among said plurality of first images, and wherein said synthesis means selects

pixels without washed-out highlights and dull shadows from the subject luminance data

of said one image and said respective images, respectively, determines respective

averages of the subject luminance data of sets of the selected pixels, and calculates

each difference between each of the determined averages of said respective images

and the determined average of said one image as each of the shifting amounts of the

respective images.”

Regarding claims 26 & 29, the prior art of record also fails to teach or fairly

suggest the limitations of each of claims 23 & 29 that includes *“said synthesis means*

comprises: a memory for storing the image data of said plurality of first images;

converting means for converting said image data of said plurality of first images read out

from said memory to subject luminance data of logarithmic scales; setting means for

setting said synthesis conditions as shifting amounts of the subject luminance data of

respective images from the subject luminance data of one image among said plurality of

first images; a first adder for adding the set shifting amounts to the subject luminance

data of said respective images, respectively; a multiplier for performing weighting to the

subject luminance data of said one image and the added subject luminance data of said

respective images, respectively; and a second adder for adding the weighted subject

luminance data of said one image and the weighted added subject luminance data of

said respective images.”

Regarding claim 48, the prior art of record also fails to teach or fairly suggest the

limitations of claim 48 that includes *“said acquiring means acquires image data of a*

plurality of third images including the image data of said plurality of second images

obtained by taking the single scene under the different exposure conditions, and said

selection means selects said image data of said plurality of second images that are

judged as the single scene among said image data of said plurality of third images

obtained by said acquiring means, and thereafter selects said plurality of optimal first

images for synthesis among said selected image data of said plurality of second

images."

Regarding claim 51, the prior art of record also fails to teach or fairly suggest the

limitations of claim 51 that includes *"said selection means forms density histograms of*

said image data of said plurality of second images, and automatically selects said

plurality of optimal first images for synthesis among said image data of said plurality of

second images using said density histograms of said image data of said plurality of

second images."

Any comments considered necessary by applicant must be submitted no later

than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on

Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NHAN T. TRAN whose telephone number is (571)272-7371. The examiner can normally be reached on Monday - Friday, 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nhan T. Tran/
Primary Examiner, Art Unit 2622